Claims

I claim:

1. A method of generating a differential image of an object in a light scattering medium,comprising the steps of:

illuminating a portion of said light scattering medium with a single burst of illuminating light to generate reflected light therefrom;

providing a charge generating photosensitive device in the path of said reflected light;

activating said charge generating photsensitive device for a period of time during which a portion of said refelcted light is collected by said charge generating photosensitive device in the form of a generated charge that is indicative of an image each instant of time during said period of time;

providing a first charge storing device and a second charge storing device, each of which is independently operatively coupled to said charge generating photosensitive device;

storing, on said first charge storing device, said generated charge present on said charge generating photosensitive device during a first part of said period of time wherein a first image is defined;

storing, on said second charge storing device, said generated charge present on said charge generating

photosensitive device during a remaining part of said period of time wherein a second image is defined; and

generating a difference between (i) said generated charge associated with said first part of said period of time and (ii) said generated charge associated with said remaining part of said period of time.

2. A method according to claim 1 wherein said first part of said period of time and said remaining part of said period of time are the same in duration.

3. A method according to claim 1 wherein said first part of said period of time and said remaining part of said period of time are different in duration.

4. A method according to claim 1 further comprising the step of applying, prior to said step of generating, a scaling factor to one of (i) said generated charge associated with said first part of said period of time and (ii) said generated charge associated with said remaining part of said period of time.

5. A method according to claim 2 further comprising the step of applying, prior to said step of generating, a scaling factor to one of (i) said generated charge associated with said first part of said period of time and (ii) said generated charge associated with said remaining part of said period of time.

6. A method according to claim 5 wherein said scaling factor has a value in the range of approximately 0.5 to 10.

7. A method according to claim 1 further comprising the step of draining said generated charge from said charge generating photosensitive device when said period of time terminates.

8. A method of generating a differential image of an object in a light scattering medium,comprising the steps of:

illuminating a portion of said light scattering medium with a single burst of illuminating light to generate reflected light therefrom;

providing a charge generating photosensitive device in the path of said reflected light;

activating said charge generating photsensitive device for a period of time during which a portion of said refelcted light is collected by said charge generating photosensitive device in the form of a generated charge that is indicative of an image each instant of time during said period of time;

providing a first charge coupling device (CCD) and a second charge coupling device (CCD), each of which is independently operatively coupled to said charge generating photosensitive device by means of a first output line and a second output line, respectively;

simultaneously applying, during a first part of said period of time, a high potential to said first output line and a low potential to said second output line wherein said generated charge present on said charge generating photosensitive device during said first part of said period of time accumulates only on said first CCD and defines a first image;

simultaneously applying, during a remaining part of said period of time, a high potential to said secnd output line and a low potential to said first output line wherein said generated charge present on said charge generating photosensitive device during said remaining part of said period of time accumulates only on said second CCD and defines a second image; and

generating a difference between (i) said generated charge associated with said first part of said period of time and (ii) said generated charge associated with said remaining part of said period of time.

9. A method according to claim 8 wherein said first part of said period of time and said remaining part of said period of time are the same in duration.

10. A method according to claim 8 wherein said first part of said period of time and said remaining part of said period of time are different in duration.

11. A method according to claim 8 further comprising the step of applying, prior to said step of generating, a scaling factor to one of (i) said generated charge associated with said first part of said period of time and (ii) said generated charge associated with said remaining part of said period of time.

12. A method according to claim 9 further comprising the step of applying, prior to said step of generating, a scaling factor to one of (i) said generated charge associated with said first part of said period of time and (ii) said generated charge associated with said remaining part of said period of time.

13. A method according to claim 12 wherein said scaling factor has a value in the range of approximately 0.5 to 10.

14. A method according to claim 8 further comprising the steps of:

draining said generated charge from said charge generating photosensitive device immediately prior to the commencement of said period of time; and

draining said generated charge from said charge generating photosensitive device immediately after said

period of time terminates.

15. A system for generating a differential image of an object in a light scattering medium when a portion of said light scattering medium has been illuminated with a single burst of illuminating light to generate reflected light therefrom, said system comprising:

a charge generating photosensitive device placed in the path of said reflected light, wherein said charge generating photsensitive device is activated for a period of time during which a portion of said refelcted light is collected by said charge generating photosensitive device in the form of a generated charge that is indicative of an image each instant of time during said period of time;

a first charge coupling device (CCD) independently operatively coupled to said charge generating photosensitive device by a first output line;

a second charge coupling device (CCD) independently operatively coupled to said charge generating photosensitive device by a second output line;

means for simultaneously applying, during a first part of said period of time, a high potential to said first output line and a low potential to said second output line wherein said generated charge present on said charge generating

photosensitive device during said first part of said period of time accumulates only on said first CCD and defines a first image;

means for simultaneously applying, during a remaining part of said period of time, a high potential to said secnd output line and a low potential to said first output line wherein said generated charge present on said charge generating photosensitive device during said remaining part of said period of time accumulates only on said second CCD and defines a second image; and

processing means for generating a difference between (i) said generated charge associated with said first part of said period of time and (ii) said generated charge associated with said remaining part of said period of time.

16. A system as in claim 15 further comprising means, coupled to said charge generating photosensitive device, for draining said generated charge from said charge generating photosensitive device immediately prior to the commencement of said period of time, and for draining said generated charge from said charge generating photosensitive device immediately after said period of time terminates.

17. A system as in claim 16 wherein said means for draining

comprises a drain line having a high potential applied thereto while each of said first output line and said second output line have a low potential applied thereto.